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A proximity detector employs a capacitive sensor, having: at least one detection antenna including numerous capacitive proximity sensors which each include a measuring electrode, the antenna being positioned close to an object or body; electronic elements for exciting the electrodes and processing the distance measurement signals originating from the capacitive sensors; and digital elements of controlling the electronic elements and of calculating the distances between the electrodes and the body or object using the processed measurement signals. The detection antenna also contains a single guard for all of the measuring electrodes. Moreover, the electronic elements have, for each detection antenna, a floating or floating excitation capacitive bridge which co-operates with polling elements in sequentially to measure the respective capacitances between each electrode and the object or body to be measured.